

Computer Science	Model Paper 1	Paper: 1
Time: 1.45 Hours	(Subjective Type)	Marks: 40

(Part-I)

2. Write short answers to any FOUR (4) questions: (8)

- (i) How many strategies can we adopt for defining a problem? Write their names.

Ans We can use three strategies, if the problem is not defined well. These are:

1. Gain background knowledge
2. Use guesses
3. Draw a picture

- (ii) What is the strategy of 'Divide and Conquer'?

Ans This strategy divides a complex into smaller problems.

- (iii) Define flowchart.

Ans A flowchart is a graphical presentation of the steps to solve a problem. We use symbols for each step, and these symbols are connected with the help of arrows to show the flow of processing.

- (iv) What is the role of algorithm in problem solving?

Ans An algorithm has a vital role in problem solving as it provides a step-by-step guide to the problem solver. It is a complete description of the solution. Usually, a computer programmer first writes an algorithm and then translates it into the code of some programming language. Sometimes, the designer of the program first makes a flowchart to solve a problem and then encodes the flowchart into an algorithm.

- (v) What is number system?

Ans A number system is the system for representation of numeric data.

(vi) Convert $(69610)_{10}$ to Hexadecimal.

Ans

16	69610
16	4350 - A
16	271 -- E
16	16 -- F
16	1 -- 0
16	0 -- 1

$$(69610)_{10} = (10FEA)_{16}$$

3. Write short answers to any FOUR (4) questions: (8)

(i) Define memory. How many types of memory, primarily? Write their names.

Ans Computer memory is any physical device capable of storing data. Primarily, there are following two types of memory:
1. Volatile Memory 2. Non-Volatile Memory

(ii) Describe Commutative Law of Boolean Algebra.

Ans Commutative law:

Commutative law states that the order of application of two separate propositions is not important. So,

(a) $A \cdot B = B \cdot A$ (The order in which two variables are AND'ed makes no difference).

(b) $A + B = B + A$ (The order in which two variables are OR'ed makes no difference.)

(iii) How many types of connection? Write their names.

Ans There are two possible types of connections:

1. Point to point 2. Multipoint

(iv) What is Bus Topology?

Ans A bus topology connects all devices of the network through a single common cable having exactly two end points. This cable is called backbone of the topology. Bus topology offers a simple way to connect devices.

(v) What is network protocol?

Ans A network protocol is a formal arrangement between two computers to send and receive information. Very specifically,

network protocol defines a set of rules and procedures for communication between a sender and a receiver.

(vi) Define routing.

Ans Routing is a process of taking data from one device and sending it to another device on a different network.

4. Write short answers to any FOUR (4) questions: (8)

(i) What is meant by patent?

Ans Patent is way to protect an idea. If you are doing research in some field and you have an idea, then you must get patent for that idea. It gives you the right to exclude others from making or selling an invention using your idea.

(ii) What do you know about cyber crime?

Ans The internet is an amazing tool for communication, allowing users to connect instantly over great distances. Unfortunately, the same communication is also a great tool for criminals. A crime in which computer network or devices are used is called a cyber crime.

(iii) Define HTML.

Ans HyperText Markup Language (HTML) is a simple language to create webpages.

(iv) How can be a tag with attributes written?

Ans Generally, a tag with attributes is written as:

<tagname attribute1="value" attribute2="value" attributeN="value">

(v) Define nested list.

Ans In a list, a list item can contain another list. Such list is called a nested list. It is useful for situations where you have multiple options for a single item in a list e.g., for writing table of contents that contain sub-sections.

(vi) Define a hyperlink.

Ans Hyperlink is such an icon, graphic, or text in a webpage, that when clicked, takes you to some other webpage.

NOTE: Attempt any TWO (2) questions.

Q.5. How do you determine requirements for a flowchart? (8)

Ans **Determining Requirements for a Flowchart:**

In a flowchart, we use input, output, decision making and processing. These concepts are described in the following. Input means taking data from a user, processing it and giving some output. For a flowchart, the requirements are to know about:

Inputs:

Input means taking data from the user. It is important to know, how many and what type of inputs are required.

Processing:

A flowchart also contains processing steps. The processing steps are used for performing calculations and storing the results of calculations. These may include increasing/decreasing a value, adding/dividing two values, etc.

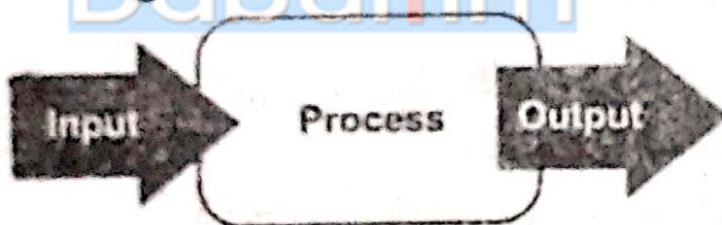


Fig. Flow from input to output.

Decision Making:

To determine whether a statement is true or false, and taking appropriate steps accordingly, is called decision making.

Outputs:

Outputs are used to display information and usually this information exhibits the processed results.

Q.6. What is network topology? Describe bus, star, ring and mesh topologies with a diagram of each. (8)

Ans **Network Topologies:**

Topology of a network is a geometric representation of the relationship among the interconnected devices. The four basic network topologies are bus, star, ring and mesh.

Bus Topology:

A bus topology connects all devices of the network through a single common cable having exactly two end points as shown in figure. This cable is called backbone of the topology. Bus topology offers a simple way to connect devices. All of the devices of the network are connected to a common transmission medium which has exactly two end points. In this simple form of networking, failure of any single device does not affect other devices connected with the cable. However, if there is some problem in the shared communication cable, then all other devices can stop functioning.

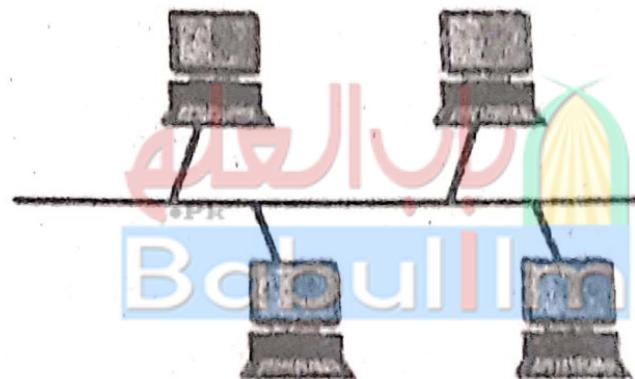


Fig. Bus Topology.

Star Topology:

A star topology connects all devices using point to point connections via cables to a central point as shown in figure.

The central point is known as a Hub or Switch. The central device controls all the traffic. Therefore, devices can transfer data to each other only through the central point. It is easy to install and reconfigure. Star topology consumes more cable than the bus topology, however, if there is some problem in a cable, then only the respective computer gets disconnected.

from the network. On the other hand, if there is some problem in the Hub or Switch, then whole network becomes dead.

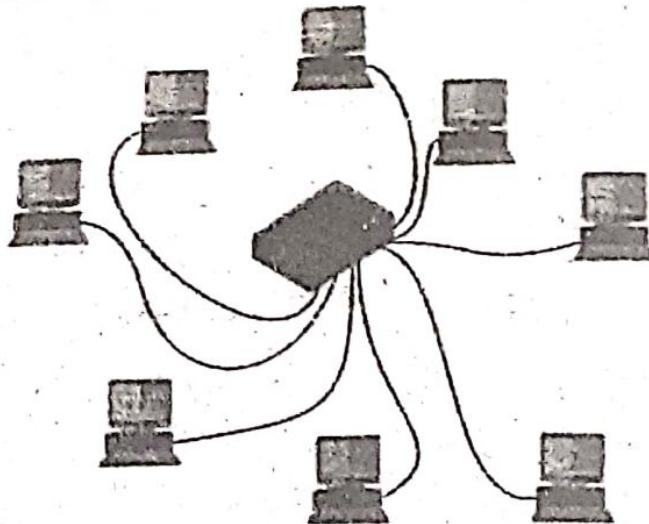


Fig. Star Topology.

Ring Topology:

A ring topology connects a computer with exactly two other computers forming a ring of computers as shown in figure. A computer can send data to its immediate neighbour. A ring can be unidirectional or bidirectional. In a unidirectional ring topology, data is sent either clockwise or anticlockwise. In a bidirectional ring topology, data can travel in any direction. Upon receiving data, a computer may pass data to its next neighbour. In this way, data reaches the desired destination. A failure of connection between two computers may bring down the whole network. Unlike star topology, it does not require a central device to manage the connectivity between the devices.

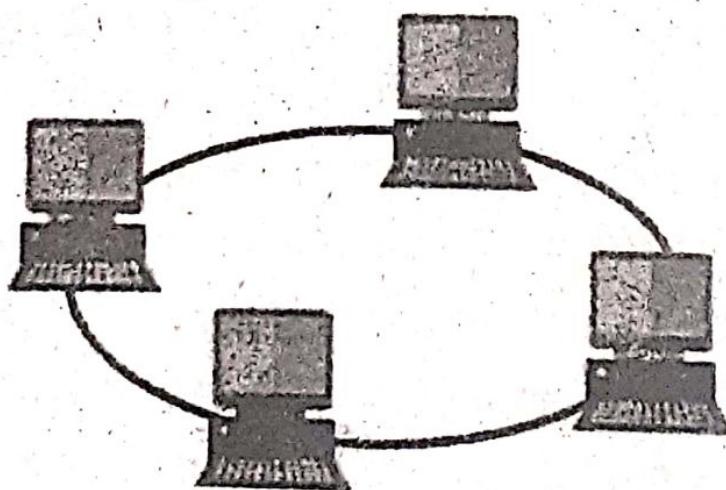


Fig. Ring Topology.

Mesh topology:

Mesh topology connects all devices with each other through a direct link as shown in figure. As compared to ring topology, data may reach its destination quickly. The mesh topology is an expensive topology in terms of cable cost as it uses a lengthy cable to connect computers as compared to the cable used in other topologies. However, the mesh topology is more reliable as it offers point-to-point connection. It is also considered more secure as data travels only between a sender and a receiver.

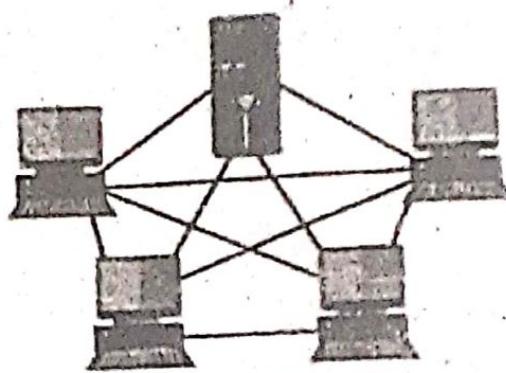


Fig. Mesh Topology.

Q.7. Describe DoS attack.

(8)

Ans **DoS (Denial of Service) Attack:**

In computing, a denial-of-service attack (DoS attack) is a cyber-attack to make a machine or network resource unavailable. It means a service is denied. For example, if you want to visit a website but someone else is already sending too many requests to the same website using computer programs, then you may not be able to access that website. This type of attack is shown in figure. It is just like a robot is sending many requests in small amount of time, but for a user, either the service becomes very slow or it is denied. So, by flooding the targeted machine or resource with superfluous requests is an attempt to overload the system. It may also cause shutting down a machine or network.

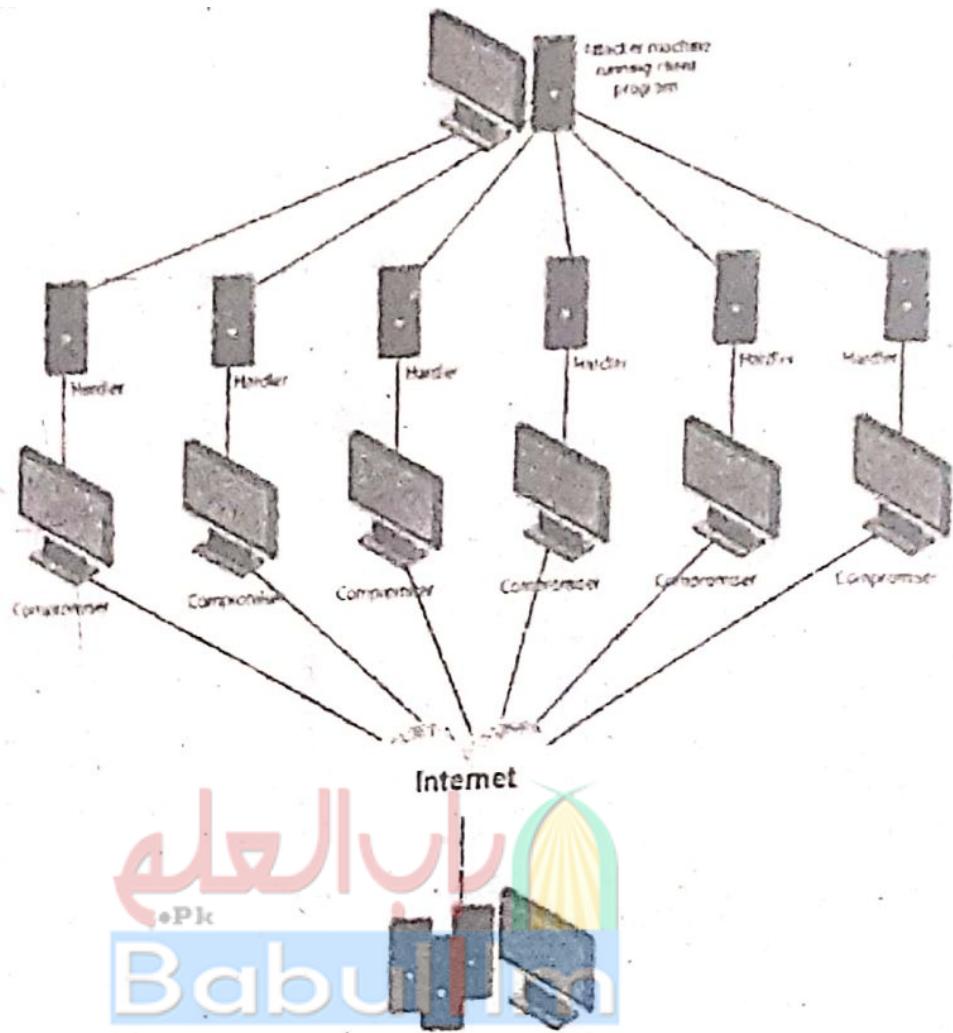


Fig. Dos Attack.

DoS attackers often target web servers of high-profile organizations such as banking, commerce, and media companies, or government and trade organizations. Though DoS attacks do not typically result in the theft or loss of significant information or other assets, they can cost the victim a great deal of time and money.